



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/823,849

04/13/2004

Yeuk-Fai Edwin Mok

AMAT/8298/CMP/ECP/RKK

5507

44257

7590

11/02/2005

PATTERSON & SHERIDAN, LLP  
3040 POST OAK BOULEVARD, SUITE 1500  
HOUSTON, TX 77056

EXAMINER

VU, DAVID

ART UNIT

PAPER NUMBER

2818

DATE MAILED: 11/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/823,849

Applicant(s)

MOK ET AL.

Examiner

DAVID VU

Art Unit

2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 15 August 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☐ Claim(s) \_\_\_\_\_ is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21 and 26-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>08/02/04&amp;07/09/04</u> .   | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### **Election/ Restriction**

1. Applicant's election without traverse of Group I (Claims 1-21&26-29) on 08/15/2005 is acknowledged.

Since Applicant cancelled all of the claims to the non-elected invention, the restriction requirement is deemed moot.

### **Claim Rejections - 35 USC § 102**

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-21 and 26-29 are rejected under 35 U. S. C. 102(e) as being anticipated by Yang et al. (US 2004/0016637, herein after Yang).

Regarding claim 1, Yang discloses an annealing system for a semiconductor processing platform, comprising a plurality of isolated annealing chambers 135, each of the isolated annealing chambers comprising: a heating plate 137 positioned in an enclosed processing volume

Art Unit: 2818

and configured to support a substrate thereon in a substantially face up orientation; a cooling plate 136 positioned in the enclosed processing volume and configured to support a substrate thereon in a substantially face up orientation; and a substrate transfer mechanism 140 positioned in the processing volume and configured to transfer substrates between the heating plate and the cooling plate {See [0058]}.

Regarding claim 2, Yang discloses the heating plate comprises a substantially planar upper substrate receiving surface having at least one vacuum chucking aperture formed therein {See [0067]}.

Regarding claim 3, Yang discloses the heating plate comprises at least one of a resistive heating element and an inductive heating element positioned in an interior portion of the heating plate below the substrate receiving surface {See [0067]}.

Regarding claim 4, Yang discloses the cooling plate comprises a substrate support member having at least one of a liquid cooling channel formed into an interior portion thereof and a thermoelectric cooling device positioned in an interior portion thereof {See [0062]}.

Regarding claim 5, Yang discloses the cooling plate comprises at least one vacuum aperture formed into an upper surface thereof {See [0062]}.

Regarding claim 6, Yang discloses the substrate transfer mechanism 406 comprises a pivotally actuated robot arm having a distal substrate supporting blade 408 positioned thereon {See [0062] and fig. 4}.

Regarding claim 7, Yang discloses the substrate support blade 408 further comprises a plurality of inwardly facing substrate support tabs 410 positioned below a main upper body

Art Unit: 2818

portion of the support blade, the support tabs being positioned to support the substrate via contact with a backside of the substrate {See [0062] and fig. 4}.

Regarding claim 8, Yang discloses the heating plate and the cooling plate 402/404 further comprise a plurality of notches 416 formed into a perimeter thereof, the plurality of notches 416 being configured to receive the plurality of inwardly facing substrate support tabs 410 when the robot blade 408 is lowered toward the heating and cooling plates 402/404 {See [0063] and fig. 4}.

Regarding claim 9, Yang discloses the plurality of isolated annealing chambers further comprise at least 3 stacked annealing chambers, each of the at least three stacked annealing chambers being fluidly separated from each other {See [0062] and fig. 3}.

Regarding claim 10, Yang discloses a gas source in fluid communication with an interior volume of each of the annealing chambers, the gas source being configured to supply an inert gas to the processing volumes to maintain the oxygen content below about 100 ppm {See [0071]}.

Regarding claim 11, Yang discloses an annealing station for a semiconductor processing system, comprising: a plurality of individual annealing chambers 135, each annealing chamber defining an isolated processing volume; a heating plate 137 positioned in the processing volume; a cooling plate 136 positioned in the processing volume {See [0058]}; and a substrate transfer robot 140 positioned to receive a substrate from an externally positioned robot in a face up orientation and position the substrate onto the heating plate and the cooling plate in the face up orientation {See [0063] and fig. 4}.

Regarding claim 12, Yang discloses the individual processing volumes are fluidly isolated from each other {See [0062] and fig. 3}.

Regarding claim 13, Yang discloses the substrate transfer robot comprises: a pivotally and vertically actuatable arm member; and a blade member attached to a distal end of the arm member, the blade member having a plurality of inwardly extending substrate support tabs positioned thereon that are configured to engage a backside of a substrate {See [0063] and fig. 4}.

Regarding claim 14, Yang discloses the heating plate and the cooling plate further comprise a plurality of vertically oriented channels formed into a perimeter of the plates, wherein the vertically oriented channels are configured to receive the inwardly extending substrate support tabs with the blade is lowered to the plane of the plates {See [0063] and fig. 4}.

Regarding claim 15, Yang discloses at least one of the heating plate and the cooling plate comprises a vacuum aperture 422 formed into an upper substrate supporting surface, vacuum aperture being configured to chuck a backside of the substrate to the respective plate {See [0066]}.

Regarding claim 16, Yang discloses a fluid channel formed into an outer body portion of each of the plurality of individual annealing chambers, the fluid channel being in fluid communication with a cooling fluid source {See [0066]}.

Regarding claim 17, Yang discloses the heating plate is configured to heat a non-production surface of the substrate positioned thereon {See [0067]}.

Regarding claim 18, Yang discloses a resistive heating element positioned in an interior portion of the heating plate {See [0067]}.

Regarding claim 19, Yang discloses a sealable access door 414 positioned in an outer body portion of the chamber {See [0070]}.

Regarding claim 20, Yang discloses a vacuum source individually in communication with each of the processing volumes, the vacuum source being configured to generate a reduced pressure in each of the processing volumes {See [0066]}.

Regarding claim 21, Yang discloses a processing gas supply selectively in communication with each of the annealing chambers {See [0062]}.

Regarding claim 26, Yang discloses a semiconductor processing platform {See [0018] and fig. 1}, comprising: a substrate loading station; at least one substrate plating cell positioned in communication with the loading station; at least one substrate cleaning cell positioned in communication with the loading station; and an annealing station positioned in communication with the loading station, the annealing station comprising a plurality of annealing chambers, each of the annealing chambers comprising: an enclosure forming a sealed processing volume; a heating plate positioned in the sealed processing volume of each of the annealing chambers; a cooling plate positioned in the sealed processing volume of each of the annealing chambers; and a substrate transfer mechanism positioned to transfer substrates between the heating plate and the cooling plate.

Regarding claim 27, Yang discloses at least one gas supply source selectively in communication with each of the sealed processing volumes, and adapted to supply a processing gas to each of the sealed processing volumes {See [0062]}.

Regarding claim 28, Yang discloses at least one vacuum source individually in communication with each of the sealed processing volumes, the vacuum source being configured to generate a reduced pressure individually in each of the processing volumes {See [0066]}.

Regarding claim 29, Yang discloses the plurality of the annealing chambers are positioned in vertically stacked configuration {See [0062] and fig. 3}.

### Conclusion

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Vu whose telephone number is (571) 272-1798. The examiner can normally be reached on Monday-Friday from 8:00am to 5:00pm. If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR, Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



David Vu

October 30, 2005.